

Application No. 10/129,948  
Reply to Office Action of December 1, 2003

layer being chosen so that the excitation and fluorescence signals pass in almost normal incidence through the thin layer." Thus, Applicants respectfully request that the rejection of Claims 11, 19, and 20 under 35 U.S.C. § 102(b) be withdrawn and the independent claims allowed.

Applicants respectfully assert that Claims 12-18, 21, and 22 are allowable for the same reasons as the independent claims from which they depend, as well as for their own features. Thus, Applicants respectfully request that the rejections of dependent Claims 12-18, 21, and 22 under 35 U.S.C. §§ 102(b) and 103(a) be withdrawn, and the allowance of dependent Claims 12-18, 21, and 22.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 11-22 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

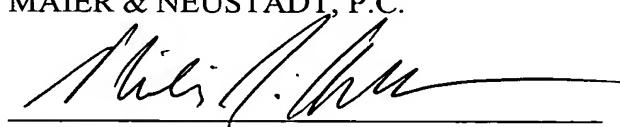
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Respectfully submitted,

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hair fixative having as a base resin amphoteric urethane resin containing carboxyl group(s) and tertiary amino group(s) in one molecule, originally antithetic physical properties such as setting ability and touch, combing ability and resistance to flaking are compatible

5 with each other by the elasticity and toughness that the urethane resin possesses. Furthermore, they have also found that for neutral water, the said hair dressing is excellent in resistance to water due to the ionic bonding of the carboxyl group(s) and the tertiary amino group(s), and, for surface-active agent solutions such as shampoo in hair

10 washability, due to dissociation of the said ionic bonding, and at the same time, the said cationic tertiary amino group(s) exhibit(s) a good adherence resulting from its interaction with the surface of negatively charged hair, and they have filed a patent application for the cosmetic resin compositions containing the said amphoteric urethane resin as

15 the principal ingredient (Japanese Patent Application No.H10-27595). Thus, the amphoteric urethane resin has extremely excellent physical properties, but on the other hand, there lies a problem in durability, and they ,(the said inventors), have repeated studies for the purpose of improvement of the durability of amphoteric urethane resin. As a

20 consequence, they have discovered that if water-soluble resin and amphoteric urethane resin are used together, the problem of the durability which is a weak point of amphoteric urethane resin can be solved by the use of water-soluble resin, and the problem of the touch which is a weak point of water-soluble resin can be solved by the use

of amphoteric resin, thus resulting in the obtaining of a cosmetic rendered with antithetic physical properties such as touch and durability, and they have attained to the present invention.

- Additionally the durability may be further improved by using  
5 nonionic resin, anionic resin ,cationic resin or amphoteric resin as said water-soluble resins.

The introduction into the structure of the said amphoteric urethane resin of the structural unit which may be derived from ethylene oxide as a nonionic hydrophilic constituent, may provide  
10 sufficient hydrophiilic nature, which ensures improvement of hair washability especially when it is used as hair cosmetic material.

Additionally, the introduction of polysiloxane bond(s) into the structure of the said amphoteric urethane resin may improve the feel which may be felt especially when it is used as hair cosmetic material.

15 **EXAMPLES**

Next, the Examples of the present invention will be described.

The cosmetic materials in accordance with the present invention may be obtained by using amphoteric urethane resin containing carboxyl group(s) and tertiary amino group(s) in one  
20 molecule, and, water-soluble resin.

The cosmetics in accordance with the present invention may be used as hair cosmetics such as foam hair fixative, gel-like hair fixative, aerosol spray hair fixative, pump spray hair fixative, or cream-like hair fixative; skin care cosmetics such as shaving cream, skin care

lotion, or sun screen lotion; and make-up cosmetics such as nail polish, mascara, or foundation, and above all, it can be suitably used as hair cosmetics.

The said amphoteric urethane resin having carboxyl group(s) and tertiary amino group(s) in one molecule may be prepared by making a prepolymer having isocyanate group(s) by reacting the polyol compound (component A), polyisocyanate compound (component B), and compound C having active hydrogen(s) and carboxyl group(s) with each other in an excess of isocyanate group(s), and allowing the said prepolymer containing isocyanate group(s) to react with the compound (component D) having active hydrogen(s) and tertiary amino group(s). Alternatively, the said amphoteric urethane resin may be also prepared by making a prepolymer having isocyanate group(s) by reacting component C and component D in reverse order, namely by allowing the said compound A, compound B, and compound D to react with each other in an excess of isocyanate group(s), and then, allowing the prepolymer containing the isocyanate group(s) to react with the said specific compound C. Such processes make it possible to produce amphoteric urethane resin more easily and safely than conventional processes. In the production process as set forth, if the reaction between the compounds A and B is made concurrently with reaction between the specific compounds C and D, the carboxyl group(s) in compound C and the tertiary amino group(s) in compound D will form salts earlier, and it follows therefore that the

resultant is insoluble in the reaction system, so that it will not react with isocyanate compounds even if it has an OH group, whereby the intended amphoteric urethane resin can not be produced.

Referring to the said polyol compound (component A), it can  
5 be any element that can be utilized in the production of common type polyurethane. General examples are polyesther polyol, polyether polyol, polycarbonate polyol, polybutadiene polyol, polyisoprene polyol, polyolefin polyol, ester polyacrylate polyol, etc. These components may be used separately or in conjunction with more than  
10 two kinds thereof. Above all, polyester polyol and polyether polyol may be adequately used.

Examples of the said polyester polyol are compounds originated from condensation polymerization of at least one kind of dicarboxylic acid such as succinic acid, glutaric acid, adipic acid,  
15 sebacic acid, azelaic acid, maleic acid, fumaric acid, phthalic acid, terephthalic acid; and at least one kind of polyhydric alcohol such as ethylene glycol, propylene glycol, 1,4-butanediol, 1,3-butanediol, 1,6-hexane diol, neopentyl glycol, 1,8-octane diol, 1,10-decane diol, diethylene glycol, spiro glycol, trimethylolpropane; or those obtained by  
20 the ring opening polymerization of lactones.

Referring to said polyether polyol, in addition to the polyhydric alcohol which is used in the synthesis of said polyester polyol, a compound resulted from ring opening polymerization of phenols such as bisphenol A, or primary amines or secondary amines with cyclic

ether such as ethylene oxide, propylene oxide, oxetane, tetrahydrofuran may be employed, and a compound resulted from ring opening polymerization of polyoxyethylenepolyol, polyoxypropylene-polyol, polyoxytetramethylene-polyol, and bisphenol A with at least one 5 of propyleneoxide and ethyleneoxide, etc. (in the case of copolymer, any of block copolymer and random copolymer may be available) can be cited by way of example.

Referring to polyisocyanate compound (component B), no specific element will be defined; organic diisocyanate compounds 10 such as aliphatic di-isocyanate compound, cycloaliphatic diisocyanate compound, perfume di-isocyanate compound can be cited by way of example, and these compounds can be used separately or in conjunction with more than two kinds thereof.

Examples of the said aliphatic diisocyanate compounds are 15 ethylenedi-isocyanate, 2,2,4-trimethylhexamethylene diisocyanate, and 1,6-hexamethylene diisocyanate, etc. Example of the said cycloaliphatic diisocyanate compounds are hydrogenated 4,4-diphenylmethane diisocyanate, 1,4-cyclohexane diisocyanate, methylcyclohexylene diisocyanate, isophorone diisocyanate, and 20 norbornane diisocyanate, etc. Examples of the said perfume diisocyanate compounds are 4,4-diphenylmethane di-isocyanate, xylene diisocyanate, toluene di-isocyanate, and naphthalene diisocyanate, etc. Of all these compounds, 1,6-hexamethylene di-isocyanate, isophorone diisocyanate, norbornane diisocyanate,

etc. are preferable in that they are excellent in resistance to light and inexpensive.

Referring to the said compound (component C) having active hydrogen(s) and carboxyl group(s), any compound which includes at least one active hydrogen and at least one carboxyl group in its molecule suffices for the occasion. So, no specific compound will be defined. Examples are dimethylol propionic acid (DMPA), dimethylol butanoic acid, polycaprolactonediol containing carboxyl group(s), etc. They can be used separately or in conjunction with more than two kinds thereof.

Referring to the said compound (component D) having active hydrogen(s) and tertiary amino group(s), any compound which includes at least one active hydrogen and at least one tertiary amino group suffices for the occasion. So, no specific compound will be defined. Examples are N-alkyldialkanolamine compounds such as N-methyldiethanolamine, N-butyldiethanolamine, and dimethylaminoethanol, etc. They may be used separately or in conjunction with more than two kinds thereof.

When prepolymer containing isocyanate group(s) is produced using said components, chain extenders or molecular weight inhibitors can be used for regulation of characteristic features of amphoteric urethane resin as end product.

Referring to the said chain extender, no specific article will be defined. Examples of the article are low-molecular polyol and amines ,

- etc. Examples of the said low-molecular polyol are glycols such as ethylene glycol, propylene glycol, 1,4-butanediol, diethylene glycol, 1,6 hexanediol, spiroglycol, cyclohexyl dimethanol, hydrogenated bisphenol A, neopentylglycol, bis (-hydroxyethoxy) benzene, and 5 xylylene glycol; and triol such as trimethylolpropane, and glycerine , etc.. Examples of said amines are ethylene diamine, propylene diamine, piperazine, hydrazine, isophorodiamine, methylene (bis-o-chloraniline), and polypropylene glycol containing amino groups at both ends.
- 10 Examples of the said molecular weight inhibitor are polypropylene glycol containing an amino group at one end and the like.
- Solvent may be used in producing the said amphoteric urethane resin, as needed. For example, it is preferable to utilize 15 organic solvent which can dissolve both raw materials and polyurethane to be prepared. Examples of the said organic solvent are amides such as N-methylpyrrolidone, dimethylformamide, and dimethylacetamide; ketones such as acetone and methyl ethyl ketone; esters such as ethyl acetate; and cellosolve acetate, and cellosolve 20 ether, etc.

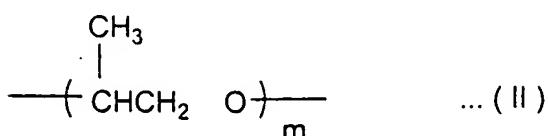
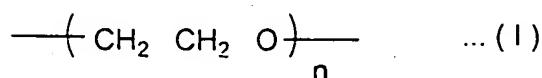
In the production of the said amphoteric urethane resin, the said resin can be provided with dispersibility in water by neutralizing the carboxyl group(s) or tertiary amino group(s) incorporated into the molecule by means of neutralizers, etc. Examples of neutralizers for

use in the said carboxyl group are triethylamine, trimethylamine, 2-amino-2-methyl-1-propanol, triethanolamine, potassium hydroxide, and sodium hydroxide, etc. Examples of neutralizers for the said tertiary amino group are acetic acid, hydrochloric acid, sulfuric acid, 5 nitric acid, and dimethyl sulfate, etc.

Polymerizing catalysts known in the field of polyurethane may be used in the production of the said amphoteric urethane resin. Examples of the said catalyst that can be utilized are tertiary amine catalyst and organic metal catalyst, etc. Examples of the said tertiary 10 amine catalyst are [2,2,2] diazabicyclooctane (DABCO), tetramethylenediamine, N-methylmorpholine, and diazacycloundecene (DBU), etc. Examples of the said organic metal catalyst are dibutyltin (tin) dilaurate, etc.

Referring to the said amphoteric urethane resin, it is 15 preferable to use resins of the type having structural unit(s) which is/are derived from ethylene oxide (EO), in terms of hair washability.

Examples of the structural unit which is derived from the said EO are the EO unit as shown in the following general formula (I), and propylene oxide (afterwards referred to as PO) unit as shown in the 20 following formula (II), and the EO unit is more preferable.



The said amphoteric urethane resin may have both EO and PO units. The ratio of the said EO unit to PO unit is preferably within the range of 10/0 to 2/8, and more preferably 10/0 to 4/6.

The repeated number n of the EO unit in the said general formula (I) is set preferably within the range of 3 to 300, and more preferably 20 to 120. That is because if n is under 3, the EO unit(s) introduced into the amphoteric urethane resin is too little, so that the amphoteric urethane resin is not given sufficient hydrophilic nature, whereby there is a risk of the said resin obtaining insufficient hair washability. Conversely, if n exceeds 300, the hydrophilic nature of the amphoteric urethane resin is too high, which may affect the moisture vapour resistance. Also, the repeated number m of the PO unit in the said general formula (II) is set preferably within the range of 3 to 300, and more preferably 20 to 120. If the said amphoteric urethane resin has both the said EO unit and PO unit, n + m preferably ranges from 3 to 300, and more preferably from 20 to 120.

The amphoteric urethane resin having the structural unit(s) which is/are derived from the said ethyleneoxide (EO) is produced by making a prepolymer having isocyanate group(s), for instance, by allowing the polyol compound (component A), the polyisocyanate compound (component B), the polyethylene oxide derivative having active hydrogen(s), and a compound (component C) having active hydrogen(s) and carboxyl group(s) to react with each other in an excess of isocyanate group(s) and then, allowing the said prepolymer

containing isocyanate group(s) to react with a compound (component D) having active hydrogen(s) and tertiary amino group(s). Alternatively, this production process can be effective even by conducting the reaction with component C and the reaction with 5 component D in reverse order. In this case, the same compounds as aforementioned may be used as the said components A to D.

Referring to the polyethyleneoxide derivative having active hydrogen(s), any element that can introduce a structural unit that is derived from ethyleneoxide (EO) into the structure of the said 10 amphoteric urethane resin may be utilized. So, no specific element will be defined. Examples are polyoxyethylene glycol(PEG),and polyoxyethylene polyoxypropylene glycol (EOPO block copolymer), etc., and more preferably, preoxyethylene glycol. The said polyethylene oxide derivative of any of the following types can be 15 utilized; both-end OH group introduction type, both-end NH<sub>2</sub> group introduction type, one-end OH group introduction type, and one-end NH<sub>2</sub> introduction type. Amphoteric urethane resin having EO unit(s) in the main chain can be obtained by the use of the said both-end OH group introduction type or both-end NH<sub>2</sub> group introduction type. 20 Amphoteric urethane resin having EO unit(s) in the side chain(s) or end(s) can be obtained by the use of one-end OH group introduction type or one-side NH<sub>2</sub> group introduction type.

The molecular weight of the said specific polyethylene oxide derivative is preferably 200 to 20000, and more preferably 1000 to 10000.

It is preferable to use amphoteric urethane resin having 5 polysiloxane bond(s) in the structure thereof for much greater improvement of the feel.

Referring to the said polysiloxane bond(s), the repeated number n of siloxane bond (Si-O) is preferably within the range of 5 to 300, and more preferably 20 to 150. This is because if n is less than 5, 10 the proportion of siloxane bonds present in an amphoteric urethane resin being obtained may be too low, whereby sufficient effects which may be essentially acquired by the introduction of polysiloxane bond(s)s are hardly obtainable in touch, combing ability, etc. and conversely, with n exceeding 300, the compatibility with other 15 materials will deteriorate due to a high level of its hydrophobic nature, thus leading to poor reaction. Moreover, there is the possibility that the hydrophobic nature of a resultant polymer is at so a high level that it may hinder the adhesion to hair.

Amphoteric urethane resin having the said polysiloxane 20 bond(s) may be produced by making a prepolymer having isocyanate group(s), for example, by causing polylol compound (component A), polyisocyanate compound (component B), polysiloxane compound having active hydrogen(s), and a compound having active hydrogen(s) and carboxyl group(s) (component C) to react with each other in an

excess of isocyanate group(s), and then, reacting the resultant prepolymer containing isocyanate group(s) with a compound (compound D) having active hydrogen(s) and tertiary amino group(s). Alternatively, this production process can be effective even by 5 conducting the reaction with component C and the reaction with component D in reverse order. In this case, the same compounds as aforementioned may be used as said components A to D.

Referring to the polysiloxane compound having active hydrogen(s) that is used together with the said components A to D, 10 any compound that can introduce the polysiloxane bond(s) into the structure of the said amphoteric urethane resin suffices for the occasion. So, no specific compound will be defined. Examples of said compound are polydialkylsiloxanediol, polydialkylsiloxanemonool, polydialkylsiloxaneamine, and polydialkylsiloxanemonoamine, etc. 15 They may be used separately or in conjunction with more than two kinds thereof. For the alkyl group(s) which bond to Si of siloxane bond(s) of the said polydialkylsiloxanediol, etc., the number of carbons is preferably 1 to 10, and more preferably 1 to 5. It does not matter if the aforementioned polysiloxane compound incorporates the alkyl 20 group(s) which bond to Si of siloxane bond(s) and have a different number of carbons intermingled with each other. Specifically, examples of the said polydialkylsiloxanediol are polydimethylsiloxanediol, polymethylsiloxanediol, etc. Examples of the said polydialkylsiloxanemonool are polydimethylsiloxanemonool,

polymethylsiloxanemonool, etc. Examples of the said polydialkylsiloxanediamine are polydimethylsiloxanedimine, polymethylsiloxanediamine, etc. Examples of the said polydialkylsiloxanemonoamine are polydimethylsiloxanemonoamine; polymethylethylsiloxanemonoamine, etc.

5 siloxanemonoamine, etc.

Examples of the said polysiloxane compounds are those of both-end OH group introduction type, both-end NH<sub>2</sub> group introduction type, one-end OH group introduction type, and one-end NH<sub>2</sub> group introduction type, etc. The use of said compound of both-10 end OH group introduction type or both-end NH<sub>2</sub> group introduction type may bring about amphoteric urethane resin having polysiloxane bond(s) in the main chain, and the use of the compound of one-end OH group introduction type or one-end NH<sub>2</sub> group introduction type may bring about amphoteric urethane resin having polysiloxane bond(s) in the side chain(s) or at end(s).

In the cosmetics in accordance with the present invention, it is preferable to use amphoteric urethane resin as aqueous liquid. With the present invention, the aqueous liquid means the water dispersion in which amphoteric urethane resin is dispersed as well as the water 20 solution in which amphoteric urethane resin is dissolved completely.

It is possible to make the water dispersion of said amphoteric urethane resin cross linkable by addition of a crosslinking agent such as a silane coupling agent. There is no restriction on adding various additives in order to impart storage stability to the said water

dispersion. Examples of the additives are protective colloid agent, anti-bacterial agent, mildewproofing agent, etc.

Referring to water-soluble resin which may be used together with the said amphoteric urethane resin, any of resins that can be utilized as cosmetics suffices for this occasion. So, no specific resin will be defined. Every type of resin, i.e. nonionic, anionic, cationic, or amphoteric type can be employed. They may be used separately or in conjunction with more than two kinds thereof.

Examples of said nonionic resins are polyvinyl alcohol,

10 polyvinyl pyrrolidone [(Luviskol K-12,17,30,60,80,90 made by BASF Corporation), (PVP K-15,30,60,90,120 made by International Specialty Products)], vinylpyrrolidone-vinyl acetate copolymer [(Luviskol VA28,37,55,64,73 made by BASF Corporation), (PVP/VA-735,535,335,235,S-630 made by International Specialty Products)],

15 (PVA-6450 made by OSAKA ORGANIC CHEMICAL IND.LTD), vinylpyrrolidone-vinyl acetate-vinyl propionate copolymer (Luviskol VA343 made by BASF Corporation), vinyl pyrrolidone-vinyl acetate-acrylamino acrylate copolymer, vinyl acetate/N-vinyl-5-methyl-2-oxazoline copolymer (Dowlex made by Dow Chemical Co.,Ltd),

20 hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropyl methyl cellulose, methyl cellulose, carboxymethyl cellulose, carboxyvinyl polymer, polyvinylformamide, and polyvinylacetamide , etc.

Examples of said anionic resins are vinyl acetate-crotonate copolymer [(Resin 28-1310 made by National Starch and Chemical

- Co.), (Luviset CA made by BASF Corporation), crotonic acid-vinyl acetate-vinyl neodecanate copolymer (Resin 28-2930 made by National Starch and Chemical Co.), crotonic acid-vinyl acetate-vinyl propionate copolymer (Luviset CAP made by International Specialty Products), vinyl acetate-monobutyl maleate-isoboronyl acrylate copolymer (ADVANTAGE-CP made by International Specialty Products), N-octyl acrylamide/alkyl acrylates copolymer [(AMPHOMER HC made by National Starch and Chemical Co.), (Ultrahold 8, Ultrahold Strong made by BASF Corporation), vinyl 5 pyrrolidone-acrylate-(meth) acrylic acid copolymer (Luviflex VBM35 made by BASF Corporation), acrylic resin alkanol amine liquid as (meth) acrylic acid-alkyl(meth)acrylate copolymer [(Pluscise series made by GOO Chemical Co., Ltd.), (Aniset KB-1000, KB-100H, NF-1000, HS-3000, AQ-2500 made by OSAKA ORGANIC CHEMICAL 10 IND.LTD.), (Diahold made by Mitsubishi Chemical Corporation), alkyl acrylate-alkyl methacrylate-diaceton acrylamide-methacrylic acid copolymer (Pluscise L-53 made by GOO Chemical Co., Ltd.), methyl vinyl ether-maleic anhydride alkyl halfester copolymer [(Gantrez ES-225, ES-425, SP-215 made by International Specialty Products), 15 (Anieres BEM-42S, VEM-22S made by OSAKA ORGANIC CHEMICAL IND.LTD.).]

Examples of said cationic resins are (lower nitrogen) hydroxyethyl cellulose dimethyldiallylammonium chloride (Celquat L-200, H-100 made by National Starch and Chemical Co.), O- [2-

hydroxy-3-(trimethylammonio) propyl hydroxyethyl cellulose chloride  
(Celquat SC240C, SC230M made by National Starch and Chemical  
Co.), vinyl pyrrolidone-quaternary dimethylaminoethyl methacrylate  
copolymer [(Gafquat 734, 755, 755N made by International Specialty  
5 Products), (H.C. Polymer 1S, 1N, 1NS, 1NP, 2, 2L, 3A, 5 made by  
OSAKA ORGANIC CHEMICAL IND.LTD.)], vinylimidazolium  
trichloride-vinylpyrrolidone copolymer (Luviquat FC370, FC550,  
FC905, HM552, MonoCP made by BASF Corporation),  
vinylpyrrolidone-dimethylaminoethyl methacrylate copolymer (Luviflex  
10 made by BASF Corporation), vinylpyrrolidone-alkylaminoacrylate-  
vinylcaprolactam copolymer (copolymer 845, 937, 958 made by  
International Specialty Products), vinylpyrrolidone-  
methacrylamidepropyl trimethylammonium chloride copolymer  
(Gafquat HS-100 made by International Specialty Products),  
15 alkylacrylamide-acrylate-alkylaminoalkylamide-polyethylene glycol  
methacrylate copolymer, polydimethylethylenepiperidinium chloride  
liquid (Marquat 100 made by CALGON Corporation),  
dimethyldiallylammonium chloride-acrylamide copolymer (Marquat  
2200, 550 made by CALCON Corporation), and cationic guagum, etc.  
20 Examples of the said amphoteric resin are octylamide  
acrylate-hydroxypropylacrylate-butylaminoethyl methacrylate  
copolymer (AMPHOMER 28-4910, LV-71 made by National Starch  
and Chemical Co.), N-methacryloyloxyethyl-N, N-dimethylammonium-  
N-methylcarboxybетaine/alkyl methacrylate copolymer [(Yukaformer

R205, R205S, SM, 301, 510, AM75, AM75S made by Mitsubishi Chemical Corporation), (RAM Resin-1000, 2000 made by OSAKA ORGANIC CHEMICAL IND.LTD.), acrylic acid-methacrylic acid-acrylic acid 2-hydroxypropyl-N, N-dimethylaminoethyl methacrylate-ethyl  
 5 methacrylate-diacetonaacrylamide-vinylpyrrolidone copolymer and its alkanolamine liquid (AP Polymer 560 made by OSAKA ORGANIC  
 10 CHEMICAL IND.LTD.), etc.

The average molecular weight of these water-soluble resins is preferably within the range of 100 to 10,000,000, and more  
 10 preferably from 10,000 to 5,000,000.

The blending proportion of the said amphoteric urethane resin to water-soluble resin in weight is preferably between 0.1/100 and 100/0.1, and more preferably 50/1 and 1/50.

In addition to the amphoteric urethane resins and water-  
 15 soluble resins, the cosmetics in accordance with the present invention may contain other ingredients which are commonly used in normal cosmetics, such as pigment, colouring matter, colouring material, perfume, surfactant, humectant, conservation agent, preservative, disinfectant, antioxidant, lubricant, thickening agent, ultraviolet  
 20 absorber, silicone polymer derivative, etc.

The cosmetics of the present invention may be produced in the following manner:

Production of hair cosmetics (foam hair fixative)

Aqueous liquid of the amphoteric urethane resins thus

obtained as mentioned above is blended with water-soluble resin; various kinds of surfactants such as polyoxy ethylene alkyl ether, coconut oil aliphatic acid diethanolamide, etc.; ethanol; de-ionized water, etc. in a predetermined proportion, and the resultant  
5 compositions are mixed until they are made homogenous to produce a component X. Then, the addition of a component Y consisting of propellant (LPG), etc. to the said component X makes the intended foam hair fixative.

Production of hair cosmetics (aerosol spray-type hair fixative)

10 Aqueous liquid of the amphoteric urethane resins thus obtained as above-mentioned is combined with water-soluble resin, de-ionized water, dioctylsodium sulfosuccinate, ethanol, etc., in a predetermined proportion, and the resultant compositions are mixed until they are made homogenous to produce a component X. Then,  
15 the addition of a component Y consisting of propellant (LPG), etc., to the said component X makes the intended aerosol spray-type hair fixative.

Production of hair cosmetics (gel-like hair fixative)

First, thickening agent, triethanolamine, ethanol, and de-  
20 ionized water, etc. are combined with each other in a predetermined proportion, and the resultant compositions are mixed until viscous gel is formed into a component X. Then, aqueous liquid of the said amphoteric urethane resin is combined with water-soluble resin, ethanol, de-ionized water, etc. in a predetermined proportion to obtain

a component Y. Then, this component Y is added to said component X, and the resultant compositions are mixed until they are made homogeneous to produce the intended gel-like hair fixative.

Production of hair cosmetics (pumping spray-type hair fixative)

- 5        Aqueous water of the said amphoteric urethane resin is combined with water-soluble resin, dioctylsodium sulfosuccinate, ethanol, de-ionized water, etc. in a predetermined proportion, and the resultant compositions are mixed until they are made homogenous to produce the intended pumping spray-type hair fixative.
- 10      Skin care cosmetics such as shaving cream, skin care lotion, sunscreen lotion, etc.; and, make-up cosmetics such as nail polish, mascara and foundation, etc. can be produced in accordance with the general production processes for these cosmetics.

Next, the Examples will be described with reference to

15      Comparative Examples.

Prior to the description of the Examples and Comparative Examples, the following materials have been prepared.

Amphoteric urethane resin (a)

- 100g of isophorone diisocyanate (IPDI), 60g of polypropylene glycol (PPG, molecular weight: 1000), 5g of cyclohexyldimethanol (CHDM), and 38g of dimethylol butanoic acid(DMBA) were put into a glass flask with four openings and equipped with an agitator, a thermometer, a nitrogen duct, and a reflux condenser, then, 60g of ethyl acetate was added as a solvent, and the materials were heated

at a temperature of 80°C in the oil bath and allowed to react for four hours. Then, 2g of N-methyldiethanol amine and 30g of ethyl acetate were added, and the mixture was held for three hours for reaction purpose. Moreover, 30g of polypropylene glycol having one amino group at one end thereof(Jeffamine M1000 made by HUNTSMAN CORPORATION) and 50g of ethyl acetate were added to the mixture, and the mixture was allowed to react for one hour, thereby obtaining a solution of polyurethane prepolymer with the residual NCO groups remaining therein. This polyurethane prepolymer with the residual NCO groups was dispersed into 750g of water containing 16g of potassium hydroxide, and subjected to chain extension at 50°C for three hours for polymerization. Ethyl acetate was recovered from water dispersion thus obtained under a low pressure to obtain aqueous matters of amphoteric urethane resin without substantial amounts of solvent.

Amphoteric urethane resin (b)

100g of isophorone diisocyanate (IPDI), 60g of propylene glycol (PPG, molecular weight:1000), 5g of cyclohexyl dimethanol (CHDM), 20g of polyoxyethylene glycol (PEG, molecular weight:1000), 20 and 36g of dimethylol butanoic acid (DMBA) were put into the glass flask with four openings and equipped with an agitator, a thermometer, a nitrogen duct and a reflux condenser, then, 60g of ethyl acetate as a solvent were added and the mixture was heated at a temperature 80 C in the oil bath to react for four hours. Then, 2g of N-

- methyl diethanol amine and 30g of ethyl acetate were added, and the mixture was held for three hours for reaction purpose. Moreover, 30g of polypropylene glycol having one amino group at one end thereof (Jeffamine M1000 made by HUNTSMAN CORPORATION) and 50g of 5 ethyl acetate were added to the mixture, and the mixture was allowed to react for one hour, thereby obtaining a solution of polyurethane prepolymer with residual NCO groups therein. This polyurethane polymer with residual NCO groups therein was dispersed in 750g of water containing 15g of potassium hydroxide and subjected to chain 10 extension at a temperature of 50C for three hours for polymerization. Ethyl acetate was recovered from the resulting water dispersion under a low pressure to obtain aqueous matters of amphoteric urethane resin without substantial amounts of solvent but including ethyleneoxide chains in its structure.
- 15 Amphoteric urethane resin (c)
- 100g of isophorone diisocyanate (IPDI) and 3g of polydimethyl siloxanediol having two OH groups at one end thereof (molecular weight: 1000), were put into the glass flask with four 20 openings and equipped with an agitator, a thermometer, a nitrogen duct and a reflux condenser and heated at a temperature of 80C in the oil bath to react for two hours. Then, 55g of polypropylene glycol (PPG, molecular weight:1000), 10g of hydrogenated bisphenol A, and 36g of dimethylol butanoic acid (DMBA) were added together with 60g of ethyl acetate as a solvent, and the mixture was heated at 80C in

the oil bath to react for four hours. Then, 2g of N-methyldiethanol  
amine and 30g of ethyl acetate were added, and the mixture was  
allowed to react for another three hours. Moreover, 30g of  
polypropylene glycol having one amino group at one end thereof  
5 (Jeffamine M1000 made by HUNTSMAN CORPORATION) and 50g of  
ethyl acetate were added to the mixture, and the mixture was allowed  
to react for another one hour, thereby obtaining a solution of  
polyurethane prepolymer with residual NCO groups therein. This  
polyurethane prepolymer with residual NCO groups therein was  
10 dispersed in 750 g water containing 15g of potassium hydroxide, and  
subjected to chain extension at a temperature of 50C for three  
hours for polymerization. Ethyl acetate was recovered from the  
resulting water dispersion under a low pressure to obtain aqueous  
matters of amphoteric urethane resin without substantial amounts of  
15 solvent but incorporating dimethyl siloxane chains in its structure.

Water-soluble resin (1) (nonionic)

Polyvinyl formamide.

Water-soluble resin (2) (nonionic)

Polyvinyl pyrrolidone (Luviskol K-90 made by BASF  
20 Corporation).

Water-soluble resin (3) (anionic)

Crotonic acid-vinyl acetate-vinyl neodecanoic acid copolymer  
(Resin 28-2930 made by National Starch and Chemical Co.)

Water-soluble resin (4) (anionic)

Acrylic resin alkanolamine liquid (Pluscise L-9909B made by  
GOO Chemical Co., Ltd.)

Water-soluble resin (5) (cationic)

5           Hydroxy ethylcellulose-dimethyl diallyl ammoniumchloride  
(Celquat L-200 made by National Starch and Chemical Co.)

Water-soluble resin (6) (cationic)

Vinyl pyrrolidone-N, N-dimethyl aminoethyl methacrylic acid  
copolymer diethylsulfate (Gafquat 755N made by International  
10       Specialty Products)

Water-soluble resin (7) (amphoteric)

Octylamide acrylate-hydroxypropyl acrylate-butylamino ethyl  
methacrylate copolymer (AMPHOMER 28-4910 made by National  
Starch and Chemical Co.)

15       Water-soluble resin (8) (amphoteric)

N-methacryloyloxyethyl-N, N-dimethylammonium-N-  
methyl carboxybetaine-alkyl methacrylate copolymer (Yukaformer SM  
made by Mitsubishi Chemical Corporation)

Polyoxyethylene stearyl ether

20       NIKKOL BS-20 made by NIKKO CHEMICALS CO., LTD.

Coconut oil aliphatic acid diethanolamide

Amicor CDE-1 made by MIYOSHI OIL & FAT CO., LTD.

Dioctyl sodium sulfosuccinate

Monawet MO-70E made by MONA INDUSTRIES INC.

Thickening agent

Alkyl acrylate-polyoxy ethylene stearyl ether itaconate copolymer (Structure 2001 made by National Starch and Chemical Co.)

5   Hair cosmetics (foam hair fixative)Examples 1a to 24a, Comparative Examples 1a to 11a

The X component was obtained by blending each material of the X components shown in the following Table 1 to 5 at the ratios shown therein and mixing until homogeneous. Subsequently, the Y 10 component was added to the X component at the ratios shown in the said Tables to make the foam hair fixative. The proportion of amphoteric urethane resin to water-soluble resin designates dry weight (this applies to the Examples and Comparative Examples.)

The properties of foam hair fixatives thus obtained in the 15 Examples and Comparative Examples were evaluated in accordance with the following standards. The results are concurrently represented in the following Tables 1 to 5.

Touch

10 panelists conducted organoleptic tests on a sample of 20 black virgin hair (length:25cm, weight:5.0g) which had been coated with 0.8g of foam hair fixative and dried at normal room temperature for evaluation of touch as should inherently be endowed with as hair cosmetics. The evaluation standard is as follows.

: 9~10 persons who felt the sample of hair to be very soft to the touch.

: 6~8 persons who felt the sample of hair to be very soft to the touch.

5 : 2~5 persons who felt the sample of hair to be very soft to the touch.

x: 0~1 person who felt the sample of hair to be very soft to the touch.

#### Durability

10 Five curls, each consisting of black virgin hair (length:15cm, weight:3g) which had been coated with 0.6g of foam hair fixative, were prepared for each test piece, and held dried at a temperature of 50°C throughout the night. Then, the dried samples of hair were hung on a board marked with a graded scale in the thermo-hygrostat where the 15 temperature was maintained at 35°C and the moisture at 90%RH. The initial length of curl (a) and the length of curl (b) after five hours were measured to find the curl retentions in accordance with the following expression, wherein L is the length of a sample of hair which has been fully stretched.

20 Curl retention (%) { (L - b)( L - a ) } × 100

It is shown that as the values of the said curl retention approach 100%, the maintenance of curls is stronger and the durability more excellent. The evaluation standard is as follows.

90% or over

70% to under 90%

50% to under 70%

Under 50%

#### Hair washability

5 A well-dressed sample of hair was prepared using black virgin hair (length:15cm, weight:3g) which had been coated with 0.6g of the foam hair fixative and dried at room temperature. Then, the said sample of hair was slightly loosen using warm water at 40C for 30 seconds, then 0.4g of 10% shampoo solvent was applied to the  
 10 sample of hair which was then washed for 30 seconds. Then, it was rinsed with warm water at 40C again to remove the shampoo solvent, and dried sufficiently at 50C . Referring to the sample of hair thus arranged, 10 panelists conducted organoleptic tests for hair-setting ability and evaluated its hair washability which the foam hair  
 15 fixative should inherently be endowed with as hair cosmetics. The evaluation standard is as follows.

: 9~10 persons who felt the sample of hair after drying to be nil in setting ability but very excellent in hair washability.

: 6~8 persons who felt the sample of hair after drying to be  
 20 nil in setting ability but very excellent in hair washability.

: 2~5 persons who felt the sample of hair after drying to be nil in setting ability but very excellent in hair washability.

: 0~1 person who felt the sample of hair after drying to be nil in setting ability but very excellent in hair washability.

Feel

For a sample of black virgin hair (length:25cm, weight:5.0g) which had been coated with 0.8g of the foam hair fixative and dried at the room temperature, 10 panelists conducted organoleptic tests and 5 evaluated the feel which the foam hair fixative should be inherently endowed with as hair cosmetics. The evaluation standard is as follows.

: 9~10 persons who felt the sample of hair after drying to have a very silky feel.

10 : 6~8 persons who felt the sample of hair after drying to have a very silky feel.

- : 2~5 persons who felt the sample of hair after drying to have a very silky feel.

x: 0~1 person who felt the sample of hair after drying to have

15 a very silky feel.

Table 1  
(Foam hair fixative)

		Example							
		1a	2a	3a	4a	5a	6a	7a	8a
(Kind)		(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
De-ionized water	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	
Polyoxyethylene stearyl ether	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coconut oil aliphatic acid diethanolamide	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Component Y	Propellant (LPG)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Touch									
Durability									
Hair washability									
Feel									

Table 2  
(Foam Hair Fixative)

		Example							
		9a	10a	11a	12a	13a	14a	15a	16a
(Kind)	Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
(Kind)	Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
De-ionized water	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	-	Proper quantity	-
Polyoxyethylene stearyl ether	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coconut oil aliphatic acid diethanolamide	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Component Y	Propellant (LPG)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Touch									
Durability									
Hair washability									
Feel									

Table 3  
(Foam hair fixative)  
(Part)

		Example							
		17a	18a	19a	20a	21a	22a	23a	24a
Amphoteric urethane Resin (Kind)	(c)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin (Kind)	(1)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
De-ionized water	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7
2-amino-2-methyl-1-propanol	-	-	-	Proper quantity	-	-	Proper quantity	-	-
Polyoxyethylene stearyl ether	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coconut oil aliphatic acid diethanolamide	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Component Y	Propellant (LPG)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Touch									
Durability									
Hair washability									
Feel									

Table 4  
(Foam hair fixative)  
(Part)

		Comparative Example							
		1a	2a	3a	4a	5a	6a	7a	8a
Amphoteric urethane resin	-	-	-	-	-	-	-	-	-
(Kind)	-	-	-	-	-	-	-	-	-
Water-soluble resin	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
De-ionized water	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7	77.7
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	
Polyoxyethylene stearyl ether	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Coconut oil aliphatic acid diethanolamide	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Component Y	Propellant (LPG)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Touch									
Durability									
Hair washability									
Feel									

Table 5  
(Foam Hair Fixative)  
(Part)

		Comparative Examples		
		9a	10a	11a
(Types)		3.0	3.0	3.0
Ampholytic urethane resin	(a)			
Water-soluble resin	(b)	-	-	-
(Kind)	(c)	-	-	-
Deionized water	77.7	77.7	77.7	
2-amino-2-methyl-1-propanol	-	-	-	
Polyoxethylene stearyl ether	0.5	0.5	0.5	
Ethanol	10.0	10.0	10.0	
Coconut oil fatty acid diethanolamide	0.8	0.8	0.8	
Component X	Propellant (LPG)	8.0	8.0	8.0
Component Y				
Touch				
Durability				
Hair washability				
Feel				

It is clear from the above Table 1 to 5 that the Examples of the foam hair fixative have very good touch, good feel, and ensure excellent hair washability because of the amphoteric urethane resin content, and are high in curl retention and excellent in durability  
5 because of the water-soluble resin content.

Particularly, the Examples of the foam hair fixative, using anionic and amphoteric water-soluble resin, are extremely high in curl retention and excellent in durability. Also, the Examples of the foam hair fixative, using amphoteric urethane resin (b) structurally having  
10 ethylene oxide chain(s), ensure excellent hair washability. Furthermore, the Examples of the foam hair fixative, using amphoteric urethane resin (c) structurally having polysiloxane bond(s), have very good feel.

In contrast, it is clear that the Comparative Examples 1a to 8a  
15 of the foam hair fixative containing water-soluble resin are high in curl retention and excellent in durability and that the said examples containing no amphoteric urethane resin have very bad touch. Also, the Comparative Example 9a to 11a containing amphoteric urethane resin have very good touch and that the said examples containing no  
20 water-soluble resin are low in curl retention and poor in durability.

Hair cosmetics (aerosol spray-type hair fixative)

Examples 1b to 24b, Comparative Examples 1b to 11b

The X component was obtained by blending each material of the X component shown in the following Table 6 to 10 at the ratios

shown therein and mixing until becoming homogeneous. Subsequently, the Y component was added to the X component at the ratios shown in the said Tables to make the aerosol spray-type hair fixative.

5 The properties of the aerosol spray type hair fixatives thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned cosmetics for hair. The results are concurrently represented in the following Tables 6 to 10.

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15

20

Table 6  
(Aerosol spray-type hair fixative)  
(Part)

		Example							
		1b	2b	3b	4b	5b	6b	7b	8b
Amphoteric urethane Resin	(Kind)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Water-soluble resin	(Kind)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	X Component	-	-	Proper quantity	-	-	-	Proper quantity	-
De-ionized water		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diocty sodium sulfosuccinate		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol		49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
Component Y	Propellant (LPG)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	Touch								
	Durability								
	Hair washability								
	Feel								

Table 7  
(Aerosol spray-type hair fixative)  
(Part)

		Examples							
		9b	10b	11b	12b	13b	14b	15b	16b
Amphoteric urethane Resin	(Kind)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin	(Kind)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
2-amino-2-methyl-1-propanol	(1)	-	-	Proper quantity	-	-	Proper quantity	-	-
De-ionized water	Component X	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diocetyl sodium sulfosuccinate	Component Y	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	Propellant (LPG)	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
Touch									
Durability									
Hair washability									
Feel									

Table 8  
(Aerosol spray-type hair fixative)  
(Part)

		Examples							
		17b	18b	19b	20b	21b	22b	23b	24b
(Kind)		(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	(8)
X De-ionized water	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Component X Diocetyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
Component Y Propellant (LPG)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Touch									
Durability									
Hair washability									
Feel									

Table 9  
(Aerosol spray-type hair fixative)  
(Part)

		Comparative Example							
		1b	2b	3b	4b	5b	6b	7b	8b
Amphoteric urethane resin	-	-	-	-	-	-	-	-	-
(Kind)	-	-	-	-	-	-	-	-	-
Water-soluble resin	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	-	Proper quantity	-
X De-ionized water	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diocetyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Component Y Ethanol	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
Propellant	Propellant (LPG)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Touch									
Durability									
Hair washability									
Feel									

Table 10  
(Aerosol spray-type hair fixative) (Part)

		Comparative Example		
		9b	10b	11b
(Kind)	Amphoteric urethane resin	3.0	3.0	3.0
	(a)	(b)	(b)	(c)
(Kind)	Water-soluble resin	-	-	-
	(b)	-	-	-
Component X	2-amino-2-methyl-1-propanol	-	-	-
	(c)	-	-	-
Component Y	De-ionized water	7.0	7.0	7.0
	(d)	-	-	-
Component Z	Diocetyl sodium sulfosuccinate	0.3	0.3	0.3
	(e)	-	-	-
Component A	Ethanol	49.7	49.7	49.7
	(f)	-	-	-
Component B	Propellant (LPG)	40.0	40.0	40.0
	(g)	-	-	-
Touch				
Durability				
Hair washability				
Feel				

It is clear from the above Table 6 to 10 that the Examples of the aerosol spray-type hair fixative have very good touch, good feel, and ensure excellent hair washability because of containing amphoteric urethane resin, and are high in curl retention and excellent 5 in durability because of the water-soluble resin content.

In contrast, it is clear that the Comparative Examples 1b to 8b of the aerosol spray-type hair fixative containing no amphoteric urethane resin have very bad touch, and that the Comparative Examples 9b to 11b of the aerosol spray-type hair fixative containing 10 no water-soluble resin are low in curl retention and poor in durability.

Hair cosmetics (gel-like hair fixative)

Examples 1c to 24c, Comparative Examples 1c to 11c

The X component was obtained by blending each material of the X component shown in the following Table 11 to 15 at the ratios 15 shown therein and mixing until forming of viscous gel. Subsequently, the Y component obtained by blending each material at the ratios shown in the said Tables, was added to the above-mentioned X component and mixed until becoming homogeneous to make the gel type hair fixative.

20 The properties of the gel type hair fixatives thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned cosmetics for hair. The results are concurrently represented in the following Tables 11 to 15.

Table 11  
 (Gel-like hair fixative)  
 (Part)

		Examples							
		1c	2c	3c	4c	5c	6c	7c	.8c
Thickening agent	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Triethanolamine	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
De-ionized water	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	
Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
De-ionized water	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
Touch									
Durability									
Hair washability									
Feel									

Table 12  
(Gel-like hair fixative)

		Examples							
		9c	10c	11c	12c	13c	14c	15c	16c
Component X	Thickening agent	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Triethanolamine	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	De-ionized water	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Component Y	Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(Kind)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
	Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Component Z	2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-
	Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	De-ionized water	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
	Touch								
Durability									
Hair washability									
Feel									

## (Get-like hair fixative)

Table 13  
(Part)

		Examples							
		17c	18c	19c	20c	21c	22c	23c	24c
Component X	Thickening agent	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Triethanolamine	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Component Y	De-ionized water	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
	Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Water-soluble resin		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	
	Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Component Z	De-ionized water	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
	Touch								
	Durability								
	Hair washability								
	Feel								

Table 14  
(Get-like hair fixative)

Comparative Examples								
	1c	2c	3c	4c	5c	6c	7c	8c
Thickening agent	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Triethanolamine	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
De-ionized water	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Amphoteric urethane resin	-	-	-	-	-	-	-	-
(Kind)	-	-	-	-	-	-	-	-
Water-soluble resin	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-
Ethanol	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
De-ionized water	34.4	34.4	34.4	34.4	34.4	34.4	34.4	34.4
Touch								
Durability								
Hair washability								
Feel								

Table 15  
 (Gel-like hair fixative) (Part)

		Comparative Examples		
		9c	10c	11c
Thickening agent		1.5	1.5	1.5
Triethanolamine		1.1	1.1	1.1
Ethanol		5.0	5.0	5.0
Deionized water		50.0	50.0	50.0
Component X	Amphoteric urethane resin	3.0	3.0	3.0
	(Kind)	(a)	(b)	(c)
Component Y	Water-soluble resin	-	-	-
	(Kind)	-	-	-
2-amino-2-methyl-1-propanol		-	-	-
Ethanol		5.0	5.0	5.0
Deionized water		34.4	34.4	34.4
Touch				
Durability				
Hair washability				
Feel				

It is clear from the above Table 11 to 15 that the Examples of the gel-like hair fixative have very good touch, good feel, and ensure excellent hair washability because of containing amphoteric urethane resin, and are high in curl retention and excellent in durability because 5 of the water-soluble resin content.

In contrast, it is clear that the Comparative Examples 1c to 8c of the gel type hair fixative containing no amphoteric urethane resin have very bad touch, and that the Comparative Examples 9c to 11c of the gel type hair fixative containing no water-soluble resin are low in 10 curl retention and poor in durability.

Hair cosmetics (pump spray hair fixative)

Examples 1d to 24d, Comparative Examples 1d to 11d

Each component shown in the following Table 16 to 20 was blended at the ratios shown therein and was mixed until becoming 15 homogeneous to make the pump spray hair fixative.

The properties of the pump spray hair fixatives thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned cosmetics for hair. The results are concurrently represented in the following Tables 20 16 to 20.

Table 16  
(Pumping spray-type hair fixative)

		Examples							(Part)	
		1d	2d	3d	4d	5d	6d	7d	8d	
(Kind)		(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	
Amphoteric urethane resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
2-amino-2-methyl-1-propanol	-	Proper quantity	-	-	-	-	-	Proper quantity	-	
Diocyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
De-ionized water	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7
Touch										
Durability										
Hair washability										
Feel										

Table 17  
(Part)  
(Pumping spray-type hair fixative)

		Examples							
		9d	10d	11d	12d	13d	14d	15d	16d
(Kind)		(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
Amphoteric urethane resin		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Water-soluble resin		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	-	Proper quantity	-	
Diocyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
De-ionized water	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7
Touch									
Durability									
Hair washability									
Feel									

Table 18  
(Pumping spray-type hair fixative)  
(Part)

		Examples							
		17d	18d	19d	20d	21d	22d	23d	24d
(Kind)	(c)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(1)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
(Kind)	(2)	-	-	Proper quantity	-	-	Proper quantity	-	-
Diocetyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
De-ionized water	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7
Touch									
Durability									
Hair washability									
Feel									

Table 19  
(Pumping spray-type hair fixative)

		Comparative Examples							
		1d	2d	3d	4d	5d	6d	7d	8d
(Kind)		-	-	-	-	-	-	-	-
Amphoteric urethane resin		-	-	-	-	-	-	-	-
Water-soluble resin		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
(Kind)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
2-amino-2-methyl-1-propanol	-	-	Proper quantity	-	-	Proper quantity	-	-	
Diocetyl sodium sulfosuccinate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ethanol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
De-ionized water	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7
Touch									
Durability									
Hair washability									
Feel									

Table 20  
 (Pumping spray-type hair fixative) (Part)

		Comparative Examples		
		9d	10d	11d
(Kind)	(a)	(b)	(c)	
Amphoteric urethane resin	3.0	3.0	3.0	
Water-soluble resin	-	-	-	
(Kind)	-	-	-	
2-amino-2-methyl-1-propanol	-	-	-	
Diocyl sodium sulfosuccinate	0.3	0.3	0.3	
Ethanol	10.0	10.0	10.0	
De-ionized water	86.7	86.7	86.7	
Touch				
Durability				
Hair washability				
Feel				

It is clear from the above Table 16 to 20 that the Examples of the pump spray hair fixative have very good touch, good feel, and ensure excellent hair washability because of containing amphoteric urethane resin, and are high in curl retention and excellent in durability  
5 because of containing water-soluble resin.

In contrast, it is clear that the Comparative Examples 1d to 8d of the pump spray hair fixative containing no amphoteric urethane resin have very bad touch, and that the Comparative Examples 9d to 11d of the pump spray hair fixative containing no water-soluble resin  
10 are low in curl retention and poor in durability.

Skin care cosmetics (skin care lotion)

Examples 1e to 4e, Comparative Examples 1e to 5e

The X component was obtained by admixing each material of the X component shown in Table 21 and Table 22 mentioned later at  
15 the ratios shown therein and heating to 80°C. Also, the Y component was obtained by admixing each material of the Y components shown in the said Tables at the ratios shown therein and heating to 80°C. Subsequently, the above-mentioned X and Y components were mixed and agitated at 80 °C for 30 minutes, and then a thickening agent was  
20 added to the mixture and agitated until becoming homogeneous. After that, the (XY) mixture was cooled down to 40°C to make the skin care lotion.

The properties of the skin care lotion thus obtained in the Examples and Comparative Examples were evaluated in accordance

with the following standards. The results are concurrently represented in the following Tables 21 to 22.

Touch

10 panelists conducted practical application tests for  
5 evaluation of the touch that the test pieces should be inherently  
endowed with as skin care cosmetics. The evaluation standard is as  
follows:

: 9 ~ 10 persons whose skin felt smooth and soft without  
feeling tight.

10 : 6 ~ 8 persons whose skin felt smooth and soft without  
feeling tight.

: 2 ~ 5 persons whose skin felt smooth and soft without  
feeling tight.

x: 0 ~ 1 person whose skin felt smooth and soft without  
15 feeling tight.

Durability

10 panelists conducted practical application tests for  
evaluation of the durability that the test pieces should be inherently  
endowed with as skin care cosmetics. The evaluation standard is as  
20 follows:

: 9 ~ 10 persons who felt the applied cosmetics very lasting  
after lapse of 6 hours.

: 6 ~ 8 persons who felt the applied cosmetics very lasting  
after lapse of 6 hours.

: 2 ~ 5 persons who felt the applied cosmetics very lasting  
after lapse of 6 hours.

x: 0 ~ 1 person who felt the applied cosmetics very lasting  
after lapse of 6 hours.

5

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15

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Table 21  
(Skin care lotion)

	Examples				
	1e	2e	3e	4e	
Octyl methoxycinnamate	7.5	7.5	7.5	7.5	7.5
Ether polyoxystearate	1.0	1.0	1.0	1.0	1.0
Emulsifiable glyceryl stearate	1.0	1.0	1.0	1.0	1.0
Steric acid	1.5	1.5	1.5	1.5	1.5
Mixture of titanum dioxide and benzoic C <sub>12-15</sub> alkyl Polyoxethylene-additive dimethicone	1.7	1.7	1.7	1.7	1.7
Component X	0.5	0.5	0.5	0.5	0.5
Amphoteric urethane resin (Kind)	0.5	0.5	0.5	0.5	0.5
Water-soluble resin (Kind)	0.5	0.5	0.5	0.5	0.5
De-ionized water	61.8	61.8	61.8	61.8	61.8
Triethanolamine (99%)	4.0	4.0	4.0	4.0	4.0
Antiseptic agent	Proper quantity	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Thickening agent (2%)	20.0	20.0	20.0	20.0	20.0
Component Y	2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity
Touch					
Durability					

Table 22  
(Skin care lotion)

	Comparative Examples				
	1e	2e	3e	4e	5e
Octyl methoxycinnamate	7.5	7.5	7.5	7.5	7.5
Polyoxystearate ether	1.0	1.0	1.0	1.0	1.0
Emulsifiable glyceryl stearate	1.0	1.0	1.0	1.0	1.0
Stearic acid	1.5	1.5	1.5	1.5	1.5
Mixture of titanium dioxide and C <sub>12</sub> -is alkyl benzoate	1.7	1.7	1.7	1.7	1.7
Polyoxyethylene-additive Dimethicone	0.5	0.5	0.5	0.5	0.5
Amphoteric urethane resin (Kind)	-	-	-	-	1.0 (a)
Water-soluble resin (Kind)	1.0 (1)	1.0 (3)	1.0 (5)	1.0 (7)	-
De-ionized water	61.8	61.8	61.8	61.8	61.8
Triethanolamine (99%)	4.0	4.0	4.0	4.0	4.0
Antiseptic agent	Proper quantity	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Thickening agent (2%)	20.0	20.0	20.0	20.0	20.0
2-amino-2-methyl-1-propanol	Proper quantity	-	Proper quantity	-	Proper quantity
Touch					
Durability					

It is clear from the above Table 21 and Table 22 that the Examples of the skin care lotion have very good touch because of the amphoteric urethane resin content and are excellent in durability  
5 because of the water-soluble resin content.

In contrast, the Comparative Examples 1e to 4e of the skin care lotion containing no amphoteric urethane resin have very bad touch, and the compared example 5e of the skin care lotion containing no water-soluble resin is poor in durability.

10 Skin care cosmetics] (shaving cream)

Examples 1f to 4f, Comparative Examples 1f to 5f

The X component was obtained by admixing each material of the X components shown in the following Table 23 and Table 24 at the ratios shown therein and heating to 80°C. Also, the Y component was  
15 obtained by admixing each material of the Y components at the ratios shown in the said Tables and heating to 80°C. Subsequently, the above-mentioned X and Y components were mixed at 80°C and cooled down to 40°C, and then proper amounts of antiseptic agent and perfume were added to the mixture to make the shaving cream  
20 agent.

The properties of the shaving cream agent thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned skin care cosmetics. The results are concurrently represented in the following  
25 Tables 23 and Table 24.

Table 23  
(Shaving cream agent)  
(Part)

		Examples			
		1f	2f	3f	4f
X	Steric acid	8.0	8.0	8.0	8.0
	Mineral oil	2.0	2.0	2.0	2.0
	Isopropyl myristate	2.0	2.0	2.0	2.0
	Glyceryl stearate	0.5	0.5	0.5	0.5
	Amphoteric urethane resin	0.3	0.3	0.3	0.3
	(Kind)	(a)	(a)	(a)	(a)
Y	Water-soluble resin	0.3	0.3	0.3	0.3
	(Kind)	(1)	(3)	(5)	(7)
	De-ionized water	72.7	72.7	72.7	72.7
	Thickening agent (2%)	10.0	10.0	10.0	10.0
	Triethanolamine (99%)	4.2	4.2	4.2	4.2
	2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity
	Touch				
	Durability				

Table 24  
(Shaving cream agent)

		Comparative Examples				
		1f	2f	3f	4f	5f
Stearic acid	8.0	8.0	8.0	8.0	8.0	8.0
Mineral oil	2.0	2.0	2.0	2.0	2.0	2.0
Isopropyl myristate	2.0	2.0	2.0	2.0	2.0	2.0
Glyceryl stearate	0.5	0.5	0.5	0.5	0.5	0.5
Amphoteric urethane resin (Kind)	-	-	-	-	-	0.6
Water-soluble resin (Kind)	(1)	(3)	(5)	(7)	-	(a)
De-ionized water	72.7	72.7	72.7	72.7	72.7	72.7
Thickening agent (2%)	10.0	10.0	10.0	10.0	10.0	10.0
Triethanolamine (99%)	4.2	4.2	4.2	4.2	4.2	4.2
2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity	-	
Touch						
Durability						

It is clear from the above Table 23 and Table 24 that the Examples of the shaving cream agent have very good touch because of the amphoteric urethane resin content, and are excellent in durability because of the water-soluble resin content.

- 5        In contrast, the Comparative Examples 1f to 4f of the shaving cream agent containing no amphoteric urethane resin have very bad touch, and the Compared Example 5f of the shaving cream agent containing no water-soluble resin is poor in durability.

Skin care cosmetics (sunscreen lotion)

- 10      Examples 1g to 4g, Comparative Examples 1g to 5g

The X component was obtained by admixing each material of the X components shown in the following Table 25 and Table 26 at the ratios shown therein and heating to 80°C. Also, the Y component was obtained by admixing each material of the Y components at the ratios shown in the said Tables and heating to 80°C. Subsequently, the above-mentioned X and Y components were mixed at 80°C to make the sunscreen lotion.

- 15      The properties of the sunscreen lotion thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned skin care cosmetics. The results are concurrently represented in the following Tables 25 and Table 26.

Table 25  
(Sunscreen lotion)

		Examples			
		1g	2g	3g	4g
Octyl methoxycinnamate		7.5	7.5	7.5	7.5
Octyl palmitate		5.0	5.0	5.0	5.0
Cetyl alcohol		1.0	1.0	1.0	1.0
Polyethylene glycol monostearate		1.5	1.5	1.5	1.5
Poly (oxyethylene oxypropylene) methylpolysiloxane copolymer		1.0	1.0	1.0	1.0
Dimethylstearylamine		2.0	2.0	2.0	2.0
Amphoteric urethane resin (Kind)	(a)	(a)	(a)	(a)	(a)
Water-soluble resin		1.0	1.0	1.0	1.0
Purified water	(1)	(3)	(5)	(7)	
Triethanolamine (99%)	0.7	0.7	0.7	0.7	
Thickening agent (2%)	10.0	10.0	10.0	10.0	
Antiseptic agent	0.25	0.25	0.25	0.25	Proper quantity
2-amino-2-methyl-1-propanol	-	-	-	-	
Touch					
Durability					

**Table 26**  
**(Sunscreen lotion)**

		Comparative Example				
		1g	2g	3g	4g	5g
Octyl methoxycinnamate		7.5	7.5	7.5	7.5	7.5
Octyl palmitate		5.0	5.0	5.0	5.0	5.0
Cetyl alcohol		1.0	1.0	1.0	1.0	1.0
Polyethylene glycol monostearate		1.5	1.5	1.5	1.5	1.5
Poly (oxyethylene oxypropylene) methylpolysiloxane copolymer		1.0	1.0	1.0	1.0	1.0
Dimethylstearylamine		2.0	2.0	2.0	2.0	2.0
Amphoteric urethane resin (Kind)		-	-	-	-	2.0
Water-soluble resin		2.0	2.0	2.0	2.0	-
	(Kind)	(1)	(3)	(5)	(7)	-
Purified water		69.0 5	69.0 5	69.0 5	69.0 5	69.0 5
Triethanolamine (99%)		0.7	0.7	0.7	0.7	0.7
Thickening agent (2%)		10.0	10.0	10.0	10.0	10.0
Antiseptic agent		0.25	0.25	0.25	0.25	0.25
2-amino-2-methyl-1-propanol		-	Proper quantity	-	Proper quantity	-
Touch						
Durability						

It is clear from the above Table 25 and Table 26 that the Examples of the sunscreen lotion have very good touch because of the amphoteric urethane resin content, and are excellent in durability because of the water-soluble resin content.

- 5 In contrast, the Comparative Examples 1g to 4g of the sunscreen lotion containing no amphoteric urethane resin have very bad touch, and that the compared example 5g of the sunscreen lotion containing no water-soluble resin is poor in durability.

Make-up cosmetics (nail polish)

- 10 Examples 1h to 4h, Comparative Example 1h to 5h

As shown in Table 27 and Table 28 mentioned later, the pigment was dispersed in de-ionized water at the ratios shown in the said Tables, and then the other components were added at the ratios shown therein. After that, the solution was uniformly agitated, mixed, 15 and deaerated to make the nail polish.

The properties of the nail polish thus obtained in the Examples and Comparative Examples were evaluated in accordance with the following standards. The results are concurrently represented in the following Tables 27 and Table 28.

- 20 Touch

10 panelists conducted practical application tests for evaluation of the touch that the test pieces should be inherently endowed with as make-up cosmetics. The evaluation standard is as follows:

: 9 ~ 10 persons felt the applied area smooth and soft without feeling tight.

: 6 ~ 8 persons felt the applied area smooth and soft without feeling tight.

5 : 2 ~ 5 persons felt the applied area smooth and soft without feeling tight.

x: 0 ~ 1 person felt the applied area smooth and soft without feeling tight.

#### Durability

10 10 panelists conducted practical application tests for evaluation of the durability that the test pieces should be inherently endowed with as make-up cosmetics. The evaluation standard is as follows:

: 9 ~ 10 persons who felt the applied cosmetics very lasting  
15 after lapse of 6 hours.

: 6 ~ 8 persons who felt the applied cosmetics very lasting after lapse of 6 hours.

: 2 ~ 5 persons who felt the applied cosmetics very lasting after lapse of 6 hours.

20 x: 0 ~ 1 person who felt the applied cosmetics very lasting after lapse of 6 hours.

Table 27  
(Nail polish)  
(Part)

		Examples			
		1h	2h	3h	4h
Amphoteric urethane resin (Kind)	5.0 (a)	5.0 (a)	5.0 (a)	5.0 (a)	5.0 (a)
Water-soluble resin (Kind)	5.0 (1)	5.0 (3)	5.0 (5)	5.0 (7)	5.0 (7)
De-ionized water	86.6	86.6	86.6	86.6	86.6
Bentonite	0.6	0.6	0.6	0.6	0.6
2-amino-2-methyl-1-propanol Aqueous phase	-	Proper quantity	-	Proper quantity	-
Pigment	2.5	2.5	2.5	2.5	2.5
Perfume	0.1	0.1	0.1	0.1	0.1
Antiseptic agent	0.1	0.1	0.1	0.1	0.1
Silicone antifoamer	0.1	0.1	0.1	0.1	0.1
Others					
Touch					
Durability					

Table 28  
(Nail polish)  
(Part)

		Comparative Examples				
		1h	2h	3h	4h	5h
Amphoteric urethane resin (Kind)	-	-	-	-	-	10.0
Water-soluble resin (Kind)	-	-	-	-	-	(a)
Water-soluble resin (Kind)	10.0	10.0	10.0	10.0	10.0	-
De-ionized water Bentonite Aqueous phase 2-amino-2-methyl-1-propanol Pigment Perfume Antiseptic agent Others	86.6 0.6 - 2.5 0.1 0.1 0.1	86.6 0.6 Proper quantity 2.5 0.1 0.1 Silicone antifoamer	86.6 0.6 - 2.5 0.1 0.1 0.1	86.6 0.6 Proper quantity 2.5 0.1 0.1 0.1	86.6 0.6 - 2.5 0.1 0.1 0.1	86.6 0.6 - 2.5 0.1 0.1 0.1
Touch Durability						

It is clear from the above Table 27 and Table 28 that the Examples of the nail polish have very good touch because of the amphoteric urethane resin content, and are excellent in durability because of the water-soluble resin content.

- 5        In contrast, the Comparative Example 1h to 4h of the nail polish containing no amphoteric urethane resin have very bad touch, and that the Comparative Example 5h of the nail polish containing no water-soluble resin is poor in durability.

Make-up cosmetics (mascara)

- 10      Examples 1i to 4i, Comparative Examples 1i to 5i

As shown in the following Table 29 and Table 30, propylene glycol, triethanolamine, thickening agent, antiseptic agent, and 2-amino-2-methyl-1-propanol were blended in refined water at the ratios shown in the said Tables and dissolved at 80°C; and then pigment

- 15     was dispersed therein to make an aqueous phase. Subsequently, each material of the Z component was blended at the ratios shown in the said Tables, and then dissolved at 80°C to make an oil phase.

The oil phase was applied into the aqueous phase and emulsified by using a homogenizing mixer. After that, each material of the Y

- 20     component was slowly applied into the homogeneous emulsion at the ratios shown in the said Tables and agitated by using a homogenizing mixer, and then the emulsion was cooled down to normal temperature to make the mascara.

The properties of the mascara thus obtained in the Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned make-up cosmetics. The results are concurrently represented in the following Tables 29 and Table 30.

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Table 29  
(Mascara)

		Examples				(Part)
		1i	2i	3i	4i	
Propyleneglycol		5.0	5.0	5.0	5.0	
Triethanolamine		1.0	1.0	1.0	1.0	
Thickening agent (2%)		10.0	10.0	10.0	10.0	
Antiseptic agent		0.5	0.5	0.5	0.5	
Pigment		10.0	10.0	10.0	10.0	
Purified water		55.5	55.5	55.5	55.5	
2-amino-2-methyl-1-propanol		-	Proper quantity	-	Proper quantity	
Ampholytic urethane resin	(Kind)	3.0	3.0	3.0	3.0	
Water-soluble resin	(Kind)	(a)	(a)	(a)	(a)	
Stearic acid	net wt	3.0	3.0	3.0	3.0	
Beeswax	Compounds	(1)	(3)	(5)	(7)	
Touch						
Durability						

Table 30  
(Mascara)  
(Part)

		Comparative Examples				
		1i	2i	3i	4i	5i
Component X	Propylene glycol	5.0	5.0	5.0	5.0	5.0
	Triethanolamine	1.0	1.0	1.0	1.0	1.0
	Thickening agent (2%)	10.0	10.0	10.0	10.0	10.0
	Antiseptic agent	0.5	0.5	0.5	0.5	0.5
	Pigment	10.0	10.0	10.0	10.0	10.0
	Purified water	55.5	55.5	55.5	55.5	55.5
	2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity	-
	Amphoteric urethane resin (Kind)	-	-	-	-	6.0
	Water-soluble resin	-	-	-	-	(a)
	Component Y	6.0	6.0	6.0	6.0	-
Component Z	(Kind)	(1)	(3)	(5)	(7)	-
	Stearic acid	6.0	6.0	6.0	6.0	6.0
	Beeswax	6.0	6.0	6.0	6.0	6.0
	Touch					
Durability						

It is clear from the above Table 29 and Table 30 that the Examples of the mascara have very good touch because of the amphoteric urethane resin content, and are excellent in durability because of the water-soluble resin content.

- 5 In contrast, the Comparative Example 1i to 4i of the mascara containing no amphoteric urethane resin have very bad touch, and the Comparative Example 5i of the mascara containing no water-soluble resin is poor in durability.

Make-up cosmetics (foundation)

- 10 Examples 1j to 4j, Comparative Examples 1j to 5j

(1) Preparation of pigment

Each component shown in the following Table 31 and Table 32 was mixed at the ratios shown therein, and then milled through a grinder to prepare the pigment.

- 15 (2) Preparation of aqueous phase

After heating de-ionized water to 70°C, bentonite was added to the water for the purpose of swelling. Subsequently, sodium carboxymethyl cellulose previously dispersed in propylene glycol was added and dissolved therein. Subsequently, triethanol amine, paraoxy 20 methyl bensoate, 2-amino-2-methyl-1-propanol, and at least one of amphoteric urethane resin and water-soluble resin were added and dissolved therein to prepare the aqueous phase.

(3) Preparation of oil phase

Each component shown in the following Table 31 and Table 32 was mixed at the ratios shown therein, and then heated at 70°C to 80°C and dissolved to prepare the oil phase.

(4) Preparation of pigment dispersed solution

5 The aforementioned pigment was added to the above aqueous phase while agitating, and then treated through a colloid mill to prepare the pigment dispersed solution.

(5) Emulsification

After heating the above pigment dispersed solution at 75°C  
10 and the oil phase at 80°C respectively, the said oil phase was added to the said pigment dispersed solution while agitating, and then cooled to 45°C at which perfume was added, continuously agitated and cooled until reaching room temperature to prepare the foundation.

The properties of the foundation thus obtained in the  
15 Examples and Comparative Examples were evaluated in accordance with the standard for the aforementioned make-up cosmetics. The results are concurrently represented in the following Tables 31 and Table 32.

Table 31

(Foundation)

(Part)

		Examples			
		1j	2j	3j	4j
Oil phase	Stearic acid	2.4	2.4	2.4	2.4
	Propylene glycol monostearate	2.0	2.0	2.0	2.0
	Cetostearyl alcohol	0.2	0.2	0.2	0.2
	Liquid lanolin	2.0	2.0	2.0	2.0
	Liquid paraffin	3.0	3.0	3.0	3.0
	Isopropyl myristate	8.5	8.5	8.5	8.5
	Propyl paraoxybenzoate	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Aqueous phase	Amphoteric urethane resin	0.3	0.3	0.3	0.3
	(Kind)	(a)	(a)	(a)	(a)
	Water-soluble resin	0.3	0.3	0.3	0.3
	(Kind)	(1)	(3)	(5)	(7)
	De-ionized water	63.5	63.5	63.5	63.5
	Carboxymethyl cellulose sodium	0.2	0.2	0.2	0.2
	Bentonite	0.5	0.5	0.5	0.5
	Propylene glycol	4.0	4.0	4.0	4.0
	Triethanolamine	1.1	1.1	1.1	1.1
	Methyl paraoxybenzoate	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Pigment	2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity
	Titanium oxide	8.0	8.0	8.0	8.0
	Talc	4.0	4.0	4.0	4.0
	Coloring pigment	Proper Quantity	Proper Quantity	Proper Quantity	Proper Quantity
	Perfume	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Touch					
Durability					

Table 32  
(Foundation) (Part)

		Comparative Examples				
		1j	2j	3j	4j	5j
Oil phase	Stearic acid	2.4	2.4	2.4	2.4	2.4
	Propylene glycol monostearate	2.0	2.0	2.0	2.0	2.0
	Cetostearyl alcohol	0.2	0.2	0.2	0.2	0.2
	Liquid lanolin	2.0	2.0	2.0	2.0	2.0
	Liquid paraffin	3.0	3.0	3.0	3.0	3.0
	Isopropyl myristate	8.5	8.5	8.5	8.5	8.5
	Propyl paraoxybenzonate	Proper quantity	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Aqueous phase	Amphoteric urethane resin	-	-	-	-	0.6
	(Kind)	-	-	-	-	(a)
	Water-soluble resin	0.6	0.6	0.6	0.6	-
	(Kind)	(1)	(3)	(5)	(7)	-
	De-ionized water	63.5	63.5	63.5	63.5	63.5
	Carboxymethyl cellulose sodium	0.2	0.2	0.2	0.2	0.2
	Bentonite	0.5	0.5	0.5	0.5	0.5
	Propyleneglycol	4.0	4.0	4.0	4.0	4.0
	Triethanolamine	1.1	1.1	1.1	1.1	1.1
	Methyl paraoxybenzoate	Proper quantity	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Pigment	2-amino-2-methyl-1-propanol	-	Proper quantity	-	Proper quantity	-
	Titanium oxide	8.0	8.0	8.0	8.0	8.0
	Talc	4.0	4.0	4.0	4.0	4.0
Perfume	Coloring pigment	Proper Quantity	Proper Quantity	Proper Quantity	Proper Quantity	Proper Quantity
		Proper quantity	Proper quantity	Proper quantity	Proper quantity	Proper quantity
Touch						
Durability						

It is clear from the above Table 31 and Table 32 that the Examples of the foundation have very good touch because of the amphoteric urethane resin content, and are excellent in durability because of the water-soluble resin content.

5 In contrast, the Comparative Examples 1j to 4j of the foundation containing no amphoteric urethane resin have very bad touch, and the compared example 5j of the foundation containing no water-soluble resin is poor in durability.

#### Effects of the Invention

10 As described above, in the cosmetics of the present invention, using as a base resin amphoteric urethane resin containing carboxyl group(s) and tertiary amino group(s) in one molecule, originally antithetic physical properties such as setting ability and touch, combing ability and resistance to flaking are compatible with  
15 each other by the elasticity and toughness that the urethane resin possesses. Furthermore, as against neutral water, the said cosmetics ensure excellent water resistance because of the ion bond(s) between carboxyl group(s) and tertiary amino group(s). On the other hand, as against surface-active agent solution such as shampoo, etc., the said  
20 cosmetics ensure excellent hair washability with dissociation of the said ion bond(s), and at the same time, the above-mentioned cationic tertiary amino group(s) interacts on the surfaces of the negatively charged hair to ensure excellent adhesion. Moreover, the cosmetics of the present invention use both water-soluble resin and amphoteric

urethane resin, therefore the problem of the durability which is a weak point of amphoteric urethane resin can be solved by the use of water-soluble resin, and also the problem of the touch which is a weak point of water-soluble resin can be solved by the use of amphoteric 5 urethane resin, and thereby the said cosmetics are provided with antithetic physical properties such as touch and durability which are required for cosmetics.

Additionally, the durability may be further improved by using nonionic resin, anionic resin ,cationic resin or amphoteric resin as said 10 water-soluble resin.

The introduction into the structure of the said amphoteric urethane resin of the structural unit which may be derived from ethylene oxide as nonionic phydrophilic constituent may provide sufficient hydrophilic nature, which ensures improvement of hair 15 washability especially when it is used as hair cosmetic material.

Additionally, the introduction of polysiloxane bond(s) into the structure of the said amphoteric urethane resin can improve the feel which may be felt especially when it is used as hair cosmetic material.